REMARKS/ARGUMENTS

In response to the pending Office Action of August 13, 2009, Applicants present the following arguments and amendments. The present amendments are requested solely for the purpose of more clearly describing and claiming the present invention and do not introduce any new matter. Applicants reserve the right to pursue the subject matter of the claims as originally presented. Applicants submit that in light of the arguments presented and amendments requested, this application is in condition for allowance. Accordingly, entry of these amendments, reconsideration of all pending rejections and objections, and passage to allowance is respectfully requested. With the entry of this amendment, claims 6-22 are pending herein.

1. Amendments to the Claims

Claims 1-5 are cancelled without prejudice to the subject matter therein. Applicants expressly reserve the right to pursue this subject matter. Cancellation of claims 1-5 does not introduce any new matter.

Amendment of claim 6 is requested to more particularly point out and distinctly claim the present invention. Support for the amendments to claim 6 are provided in claims 1, 5 and 6 as originally presented and throughout the specification, for example in paragraphs [0019], [0020] and [0024] through [0027]. The requested amendment of claim 6 does not introduce any new matter.

Amendment of claim 9 is requested to more particularly point out and distinctly claim the present invention. Support for the amendments to claim 9 are provided in claims 1, 5 and 9 as originally presented and throughout the specification, for example in paragraphs [0019], [0020] and [0024] through [0027]. The requested amendment of claim 9 does not introduce any new matter.

New claim 17 is presented to more particularly point out and distinctly claim the present invention. Support for new claim 17 is provided by claims 1, 2, 5 and 6 as originally presented, and throughout the specification. For example, support for new claim 17 can be found in paragraph [0022]. New claim 17 does not introduce any new matter.

New claim 18 is presented to more particularly point out and distinctly claim the present invention. Support for new claim 18 is provided by claims 1, 3, 5 and 6 as originally presented, and throughout the specification. For example, support for new claim 18 can be found in paragraph [0023]. New claim 18 does not introduce any new matter.

New claim 19 is presented to more particularly point out and distinctly claim the present invention. Support for new claim 19 is provided by claims 1, 4, 5 and 6 as originally presented, and throughout the specification. For example, support for new claim 19 can be found in paragraph [0021] and Table 1. New claim 19 does not introduce any new matter.

New claim 20 is presented to more particularly point out and distinctly claim the present invention. Support for new claim 20 is provided by claims 1, 2, 5 and 9 as originally presented, and throughout the specification. For example, support for new claim 20 can be found in paragraph [0022]. New claim 20 does not introduce any new matter.

New claim 21 is presented to more particularly point out and distinctly claim the present invention. Support for new claim 21 is provided by claims 1, 3, 5 and 9 as originally presented, and throughout the specification. For example, support for new claim 21 can be found in paragraph [0023]. New claim 21 does not introduce any new matter.

New claim 22 is presented to more particularly point out and distinctly claim the present invention. Support for new claim 22 is provided by claims 1, 4, 5 and 9 as originally presented, and throughout the specification. For example, support for new claim 22 can be found in paragraph [0021] and Table 1. New claim 22 does not introduce any new matter.

2. Rejection of Claims 1-15 under 35 U.S.C. § 112 2nd Paragraph

Claims 1-15 are rejected under 35 U.S.C. § 112 2nd Paragraph as allegedly indefinite. In support of these rejections, the Examiner asserts:

> "Claim 1 fails to particularly point out and distinctly claim the quality control probe in a manner which makes clear the structural limitations of said quality control probe."

Applicants respectfully disagree with the rejections under 35 U.S.C. § 112 2nd Paragraph and request reconsideration and withdrawal thereof in light of the present amendments and arguments.

Applicants assert that claims 6 and 9 as amended with this response, from which all other pending claims depend, meet the standard of definiteness under 35 U.S.C. § 112 2nd Paragraph. Amended claims 6 and 9 clearly recite multiple structural limitations of the quality control (QC) probes of the claimed invention. For example, the QC probes of the amended claims comprise "an oligonucleotide labelled at one or more positions with a fluorescent material having a different excitation/emission wavelength from a fluorescent material labelled in the target material."

3. Rejection of Claims 1-5 under 35 U.S.C. § 102 or 103

Claims 1-5 are rejected under 35 U.S.C. § 102(b) or alternatively 103(a) as allegedly unpatentable over Heller et al. (US Patent 4,996,143). In support of these rejections, the Examiner asserts:

> "Heller et al. teach an oligonucleotide probe which comprises all of the structural limitations recited in claims 1-5. Admittedly, Heller et al. do not teach using their probe(s) as controls for inspecting a quality of a microarray, however this is an intended use limitation and therefore does not further limit the claimed invention."

Claims 1-5 are further rejected under 35 U.S.C. § 102(b) or alternatively 103(a) as allegedly unpatentable over Saiki et al. (PNAS 86: 6230-6234, 1989). In support of these rejections, the Examiner asserts:

> "Saiki et al. teach a labelled oligonucleotide probe comprising a base sequence. Saiki et al. do not teach labeling their probe/primers with a fluorescent material. However, as evidenced by at least Heller et al. the use of fluorescent materials to label oligonucleotide probes/primers was well known prior to the instant invention. Therefore, absent an unexpected result it would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to substitute a fluorescent label as taught by Heller et al. for the biotin label described by Saiki et al."

Applicants respectfully disagree with the Examiner's characterization of the cited references and rejections under 35 U.S.C. § 102(b) and 103(a). However, claims 1-5 are cancelled with this Amendment and Response, rendering these rejections moot.

4. Rejection of Claims 1 and 9 under 35 U.S.C. § 102 or 103

Claims 1 and 9 are rejected under 35 U.S.C. § 102(b) or alternatively 103(a) as allegedly unpatentable over Saiki et al. (PNAS 86: 6230-6234, 1989). In support of these rejections, the Examiner asserts:

> "Saiki et al. teach a microarray comprising an oligonucleotide having a sequence complementary to the base sequence of a target product. Saiki et al. do not teach using their probe(s) as controls for inspecting a quality of a microarray, however this is an intended use limitation and therefore does not further limit the claimed invention."

Applicants respectfully disagree with the Examiner's characterization of the cited references and rejections under 35 U.S.C. § 102(b) or 103(a). Claim 1 is cancelled with

this Amendment and Response, rendering this rejection of claim 1 moot. Reconsideration and withdrawal of the pending rejections of claim 9 is respectfully requested in light of the present amendments and the arguments presented below.

First, Saiki et al. does not anticipate or render obvious claim 9 as presently amended because this reference does not disclose "a microarray having immobilized thereon: a spacer base; and a quality control (QC) probe". Specifically, Saiki et al. does not disclose the *both* a target probe *and* **a QC probe** in which an oligonucleotide is labeled with a fluorescent material having a different excitation/emission wavelength from a fluorescent material labeled in the target material *or alternatively* **a QC probe which acts as a target probe** in which an oligonucleotide, having a complementary sequence to a base sequence of a target material, is labeled with a fluorescent material having a different excitation/emission wavelength from a fluorescent material labeled in the target material. In fact, the disclosure of Saiki et al. does not disclose or even contemplate fluorescence or inclusion of fluorescent material.

Applicants have discovered a microarray configuration which provides for inspecting the quality of the microarray before, after or during use. The combined target probe and QC probe (or alternatively the QC probe which acts as a target probe) having an attached fluorescent material are provided to rapidly and accurately identify a hybridization reaction and an immobilization state of the probe on the support and whether a problem has occurred during spotting (see paragraph [0030]), thus ensuring the reliability of results obtained from the microarray. These unexpected and remarkable effects of the claimed invention are not suggested nor taught by Saiki et al.

Second, as noted above, the scope of the cited prior art is deficient with respect to key aspects of the present invention as claimed, and further, Applicants assert that this deficiency of the cited art extends well beyond a reasonably predictable variation of the prior art teaching in Saiki et al. [See, Examination Guidelines for Determining

Obviousness Under 35 U.S.C 103 in View of the Supreme Court decision in KSR International Co. V. Teleflex Inc., Fed. Register, Vol. 72. No. 195 (2007); "When considering obviousness of a combination of known elements, the operative question is whether the improvement is more than the predictable use of prior art elements according to their established functions."]. The invention of the rejected claims is not merely routine immobilization of a target probe on a microarray surface. Rather, the invention as claimed relates to a fundamentally distinct microarray, achieved by immobilizing a QC probe and a target probe on the surface of the microarray where the QC probe is configured for separately and independently determining the presence or absence of the probe on the microarray surface. Further, the fundamentally different approach of the claimed microarray is specifically designed, for example, to inspect a quality of a microarray (claim 12), to inspect immobilization state of the probes *after* hybridization reaction with a target product (claim 14), to *simultaneously* inspect an immobilization state of the probes and a hybridization reaction with a target product (claim 15), or to allow labeling with fluorescent material at any position of the QC probe (claim 20), applications which Applicants note are not described or even contemplated in the teachings of Saiki et al.

Applicants assert that the cited reference does not anticipate nor render obvious claim 9 because Saiki et al. does not disclose all the limitations of the claims as amended herein, and the missing limitations are well outside the grasp of the skilled artisan at the time of the invention. All words in a claim must be considered in judging the patentability of that claim against the prior art (*see In re Wilson*, 424 F.2d 1382, CCPA 1970). Particularly, the cited reference does not disclose, teach or suggest immobilizing on a microarray a target probe comprising "an oligonucleotide having a sequence complementary to a base sequence of a target material" and a quality control probe which comprises "an oligonucleotide labelled at one or more positions with a fluorescent material having a different excitation/emission wavelength from a fluorescent material labelled in the target material" or "a QC probe which acts as a

target probe" comprising "an oligonucleotide having a sequence complementary to a base sequence of a target material" and "labelled at one or more positions with a fluorescent material having a different excitation/emission wavelength from a fluorescent material labelled in the target material." Accordingly, Applicants respectfully request reconsideration and withdrawal of the present rejection of claim 9 under 35 U.S.C. § 102(b) or alternatively 35 U.S.C. § 103(a).

5. Rejection of Claims 1-5 under 35 U.S.C. § 103(a)

Claims 1-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Saiki et al. (PNAS 86: 6230-6234, 1989) in view of Heller et al. (U.S. Patent 4,996,143). In support of these rejections, the Examiner asserts:

> "Saiki et al. teach a labelled oligonucleotide probe comprising a base sequence. Saiki et al. do not teach labeling their probe/primers with a fluorescent material. However, as evidenced by at least Heller et al. the use of fluorescent materials to label oligonucleotide probes/primers was well known prior to the instant invention. Therefore, absent an unexpected result it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to substitute a fluorescent label as taught by Heller et al. for the biotin label described by Saiki et al."

Applicants respectfully disagree with the Examiner's characterization of the cited references and rejections under 35 U.S.C. § 103(a). However, claims 1-5 are cancelled with this Amendment and Response, rendering these rejections moot.

CONCLUSION

In view of the foregoing, this case is considered to be in condition for allowance and passage to issuance is respectfully requested. If new issues of patentability are raised, the Examiner is invited to call and arrange for an opportunity to discuss these issues via telephone interview.

It is believed that fees of $65.00 for a one month extension are required for this submission. Therefore, payment is being made via the Electronic Filing System with this submission. If this is incorrect or if any additional fees or further extensions of time are required, however, please charge the appropriate fees required for this submission and any extension of time required, or credit any overpayment, to Deposit Account No. 07-1969.

Respectfully submitted,

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